The British Interplanetary Society

INDEX
TO
VOLUME 8

This index covers the six bi-monthly Journals issued from January to December, 1949, and the Annual Report and List of Members issued at the end of that year.

INDEX

JOURNAL OF THE BRITISH INTERPLANETARY SOCIETY
VOLUME EIGHT

A

A.4 (*see* V.2)
A.20A, assisted take-off unit, 146
Absorption coefficients, gamma rays in lead, 150
Absorption, of electromagnetic rays in atmosphere, 181
Abstracts, 37, 86, 124, 171, 242
Aerobee rocket
  cosmic ray measurements, 124
  description and characteristics, 233
  launching rack, 142
  magnetic measurements, high-altitude, 2
  photographs taken from, 136, 137
  programme, 232
Aerodynamics
  drag in rarefied gases, 129
  free molecule flow, 126
Aerojet rockets, assisted take-off with, 144
Aeronautics, rockets as research tools in, 246
Air requirements
  for athletes, 87
  for spacestations, 14
Air resistance, 76
Aircraft propulsion systems, comparison, 87
Animals, effect of neutrons on, 130
"Aphrodite Project," 240
Arbeitsgemeinschaft für Weltraumfahrt, 51
Assisted take-off units, 144–6
  de Havilland "Sprite," 229, 237, 246
Asteroid, new, 202
Astronaut, 118
Astronautics
  astronomy and, 180, 255A
  conference, 202
  in France, 20
  in Germany, 49
  pioneers, 258
  progress, post-war, 143
  in Russia, 20, 238
Astronomical films, 223
Astronomical observatory,
  on Moon, 185–6
  in space, 10
Astronomy
  and Astronautics, 180, 255A
  morphological, 115, 131, 191
  stellar, 90
Atmosphere
  absorption, of spectrum, 181
  astronomy impeded by, 180
  data, high-altitude, 126, 171, 247
  heat transfer, to high-altitude missiles, 37
  irrespirable, breathing in, 40
  of Mercury, 119
  of spacestation, 16
  spray region, 255A
Atmospheric breaking, 76, 82
Atomic
  Age, 42
  booster, 157
  energy, direct use of, 62, 199
  ion rocket, 59, 63
  power, 129, 251
  propulsor, of circum-lunar rocket, 164
  reactor,
    gaseous, 30
    solid, 24
  rocket, 23, 59, 253A
    practicability, 242
    shielding, 149
    take-off, 52
    working fluids, 33, 199
  "sails," 63

B

Balancing organs, of ear, 86
Ballistic measurements, 128
Barn, unit of area, 26
Bases, orbital, 1
Bayerische Motor Works, 129
Bell X–1 aircraft, 39, 147
Beta-emitter, for rocket propulsion, 63,69
Biographies
  Burgess, E., 22
  Clarke, A. C., 21
  Cleator, P. E., 206
  Gatland, K. W., 168
  Humphries, J., 168
  Nonweiler, T. R. F., 206
  Oberth, H., 167, 210
  Ross, H. E., 123
  Shepherd, L. R., 85
  Slater, A. E., 205
  Smith, R. A., 124
  Thompson, G. V. E., 85
Boeing XB–47 Stratojet bomber, 144
Booster (*see also* Assisted take-off units)
  atomic, 157
  chemical, for circum-lunar rocket, 165
Breslauer astronomische Vereinigung, e.V., 49
British Interplanetary Society
  accounts, 1949, 261, 264–5
  A.G.M.
    1948, 19
    1949, 200, 253, 257
  Articles of Association and Bye-laws, 263
  Book list, new, 204
  broadcasts, 261
  Chairman's Address, 257
  conversazione, 19, 213
  Council, 21, 85, 123, 168, 200, 205, 263
  essay competition, 238

BRITISH INTERPLANETARY SOCIETY—contd.
film shows, 255, 256, 259
Honorary Fellows, 115, 167, 239, 258
Journal, and binders, 21, 116
library, 259
donations, 21, 205, 228, 260
meetings, 44, 92, 212, 255A, 254, 256, 259
members, 1949, list of, 266–88
membership, 257
model programme, 19, 162
publications, 258
history of, 117
Technical Advisory Committee, 261

C

C.B.A.S., 118
Cameras used in rockets, 136
Carbon dioxide, removal from atmosphere, 17
Centrifugal force, as pseudo-gravity, 8, 56
Ceramics, as combustion chamber linings, 38, 243–4
Characteristic velocities, 173
Chinese rockets, 127
Circular orbits, 3, 52, 75
Circumlunar rocket, 162, 231
Cloud chamber, in V.2, 128
Coelostat, 10
Combustion chamber
characteristic length, 103
cooling, 106
design, 99
materials, 38, 87, 103, 243–4
pressure, 100
temperature, 94
Combustion processes, 103
resonance burning, 171
Composite landing rocket, 55
Compton effect, 149
Control room, for static tests, 111
Convair 774, 128
Conversazione, 19, 213
list of exhibits, 225–8
Coolants, 99, 105, 106
Cooling,
film-, 106
liquid-, 99, 105, 129
sweat-, 127
Cordite pressurising, 110
Correspondence, 131, 210, 253A
Corrosion, in acids, 125
Cosmic ray research, 2, 124, 128
Council, KnowYour, 21, 85, 123, 168, 205
Crew, of spacestation, 11
Crew chamber, of rocket, 56
Cuban rocket posts, 135, 254A

D

De Havilland "Sprite," 229, 237, 246
Density, atmospheric, high-aititude, 247
Destruction, pointless, by Man, 131, 253A
Deuterium shielding, 156
Diameters, planetary, 120
Diesel oil, as propellant, 104
Drag, in rarefied gases, 129
Drive, nose- or tail-, 120
Drive of lunar telescope, 186
Dust clouds on Moon, 54
Dutch rocket symposium, 239
Dynamics of Spaceflight, 71

E

Ear, balancing organs, 86
Earth
atmosphere, 247
curvature, 145
diameter, 120
escape velocity, 72
gravitational field, 72, 83
magnetic field measurements, 2
satellite vehicle (*see also* Spacestation)
programme, 138
surface, high-altitude photographs, 137, 145
Earth-Moon radio, 186
Earth-Moon trip, minimum velocity, 76
Earth-planet trips, minimum velocities, 80
Electromagnetic spectrum, 182
Electron, collision with gamma photon, 149
Electronic stabilisers, 190
Electron-positron pair, 149
Elliptical orbits, 79
Emplacements for rocket tests, 112
Energy diagram
of earth-moon system, 74
of solar system, 78
Energy evolution, in jet and rocket propulsion, 21
Energy problems of spaceflight, 129
Errata, 204
Escape
technique, orbital, 57, 62
velocity, 74, 79, 83
effect of distance, 72
from planets, 72
work done in, 73
Exit area, of rocket motor, 102
Expendable-tank step rocket, 163, 164, 171, 214

F

Film cooling, 106
Filter, Lyot, 224
Fire hazards of propellants, 97
Fission cross-section, 26, 33
Fission reaction, types of, 24
Flight, high-speed, principles, 39
Fluid flow, 88, 89, 244
Flying Rocket, 141
Food requirements
for athletes, 87
for spacestation, 14
Forces acting on rocket, 120
Forrestal Report, 138, 146, 157
Fortschrittliche Verkehrstechnik, e.v., 49

French rocket societies, 20
Fruit flies, cosmic rays and, 2
Fuels (*see also* Propellants), 88, 94
  choice of, 99
  for "Sprite" A.T.O. unit, 229
  supply systems for, 107

G

Galcit tests of A.T.O. unit, 146
Gamma ray absorption, 149
Gantry for servicing rockets, 234
Ganymede, 72
Gas flow
  equations, 88
  through nozzle, 125, 242
Gas
  interplanetary, 248
  pressurising, 109
  rarefied, drag in, 129
Gaseous atomic reactor, 23, 27, 30
Gases, thermodynamic properties, 128, 129
Geology, applied to selenology, 90
German rocket societies, 49
Gesellschaft für Weltraumforschung, 49, 114
  conference, 202
  Honorary Fellows, 204
  Journal, 203
Goddard Professorships, 116
Graphite, combustion chamber linings, 38, 87
Gravitational field
  of Earth, 72, 83
  of planets, 72
  of Sun, 72, 76
Gravity
  effects in spacestation, 8
  pseudo-, 8, 56
  zero-, laboratory, 8
Gypsum, combustion chamber lining, 38, 243

H

H.W.K. 109–509 A.2
  combustion pressure, 100
  fuel pump, 110
Hartley band, 183
Hazards, fire, with propellants, 97
Heat transfer
  convection, 105
  high-altitude, 37
  in atomic reactor, 24
  in rockets, 111
  porous metals, sweat-cooled, 127
History of B.I.S. publications, 117
Homing beacon, 56
Honorary Fellows
  of B.I.S., 115, 167, 239, 258
  of G.f.W., 204
Hydrazine, properties, 246
Hydrogen peroxide
  as oxidant, 94, 125
  as propellant, 125, 229, 246
  on spacestation, 16
  stability, 98, 242

I

Ignition of propellants, 107
Illumination, background, of sky, 180, 255A
Image stabilizer, 115
Indian postal rockets, 134
Individual step mass ratio, 174
Injectors, 106
Instruments, position in A.4, 194
Interplanetary
  conference, 203
  journeys, velocities, 80, 82
  research station, 241
  societies, 20, 49, 147, 256
  travel, books, 39, 42, 172
Interstellar matter, 189
Inventions and patents, 44
Ion rocket, 59, 63, 67
Ionosphere, temperature, 247

J

Jet propulsion
  energy evolution in, 21
  prospects, 245
Jupiter
  escape velocity, 72
  gravity, 72
  rotation of, film, 225

K

Know Your Council, 21, 85, 123, 168, 205

L

Laboratory, spacestation, 8, 11
Landing
  air-braking, 76, 82
  of circumlunar rocket, 165
  problems, 54, 55
Launching rack, for Aerobee, 142
Lectures, 44, 92, 211, 255A, 254, 256
Lenses, gravitational, 116
Life
  on Moon, 132
  in Universe, 200
Lunar (*see* Moon)

M

Magnesium doublet, 183
Magnetic storms, 183
Magnetism
  lunar, 185
  stellar, 185, 189
  terrestrial, 2, 183
Mail rockets, 133
Man and His Mark, 131, 253A
Mars
  canals, drawings, 41
  escape velocity, 72, 119
  gravity, 72
  velocity to reach, 80
Mass, critical, of uranium, 26

Mass ratios, 173
and shielding, 154, 179
for step rockets, 174
Materials of construction, 38, 87, 109, 125, 129, 243
Matter, interstellar, 189
Mercury, 119
escape velocity, 72
gravity, 72
orbital speed, 77
Metagalactic structure, 190
Metals
corrosion-resistance, 109, 125, 129
porous, heat transfer, 127
surface treatment, 129
Meteors
artificial, 89, 116, 184
danger to spaceflight, 88, 157
and lunar rays, 185
protection from, 162
statistics, 157
study of, 184
Ministry of Supply experimental rocket, 237
Miranda, 200
Mirror
for lunar telescope, life of, 186
solar, of spacestation, 8
Missile, long-range, limitations, 172
Missiles, Guided, 128, 129
antiaircraft, 88
ballistic measurements, 128
nomenclature, 129
performance calculation, 89
Swedish, 238
telemetering, 124
Model programme, 19, 162
Models at Conversazione, 219
Moderating material, for thermal reactor, 25
Momentum transformer, of ion rocket, 69
Moon
Can We Fly to the, 197
craters, 244
density, 119
escape velocity, 72
gravity, 72
journey to, 1, 5, 6, 75
life on, 132
observatory on, 185–6
precession, 187
radio echoes from, 126
rays on, 185
shooting at, 131, 253A
surface
history, 90
stability, 132
voyages to, novels, 207
Morphological astronomy, 115, 131, 191
Motor, rocket, design of, 93, 129
Munroe Effect, 89
Mutation by radiation, 2, 252

N

NATIV, 128, 146
Natter, 222
Nebulae, extra-galactic, 190
Neptune, new satellite of, 200
Neptune (rocket) (*see* Viking)
Nereid, satellite of Neptune, 200
Neue Fahrzeug, 49
Neutrons
animals, effect on, 130
number/fission of uranium, 26
News flashes, 204
Nitric acid
corrosion in, 99, 125
as oxidizer, 94, 96
storage, 98, 99
Nitromethane, as propellant, 86
Nordwestdeutsche GfW, 51
Nose Drive or Tail Drive? 120
Notes and News, 19, 114, 200, 238
Nozzle, of rocket motor,
design, 102
flow through, 125, 242
Nuclear-chemical step rocket, 156
Nuclear power, 129, 251
Nuclear rockets (*see* atomic rockets)
Nuclear reactor testing station, 201

O

Observatory
on Moon, 185
in space, 10
Orbital Bases, 1
Orbital escape technique, 57, 62
Orbital rockets, 3, 5
Orbital velocities, 72, 75
Orbits
circular, 3, 52, 74
in Earth/Moon field, 53
in Earth's field, 79
elliptical, 80
sub-, for lunar trip, 5, 6
and trajectories, 78
transfer-, 81
velocity in, 83
Oxidants, 94, 95, 125
Oxygen, liquid, 94

P

Pacific Rocket Society, circumlunar rocket, 231
Parachute, high-altitude, 139
Payload ratio, 178
Pecker disc-rocket, 57
Peenemunde, 50
Penetration, by meteors, 158
Phobos, escape velocity and gravity, 72
Photoelectric effect, 149
Photoelectric telescope, 115
Photographs from rockets, 129, 136, 145
Planets
diameters, 120
escape velocities, 72
gravity, 72
Poles, lunar and terrestrial, motion of, 186
Posts, rocket, 133, 219, 220, 254A

Potential energy diagram
  Earth/Moon system, 74
  solar system, 78
Power, solar, 3, 8
Precession, lunar and terrestrial, 186
Pressure, atmospheric, high-altitude, 247
Pressure vessels, design and fabrication, 245
Pressurising, gas-, 109
Price of oxidants, 96
Progress in Astronautics, post-war, 143
"Project Aphrodite," 240
Prominences, solar, 223
Propellants, 88, 94, 125, 179, 246
  choice of, 99
  injection, 106
  nuclear, 33
    as shielding, 152
  solid, 39
  stability, 86, 98
  supply system, 107, 129, 246
Pseudo-gravity, 8, 56
Pumps, 110
Pyrometer, absorption-emission, 39

Q

Quarters, living, of spacestation, 8

R

Radar observation of meteors, 184
Radiation dosage, 152
Radiation shield
  design, 149
  and mass ratio, 154
Radio
  communication with planets, 127
  Earth/Moon communication, 186
  echoes from Moon, 126
  and spacestation, 4
  window, 181
Radius, critical, of U^{235}, 25
Rakete, 49
Ratios, mass-, 154, 173
Reactor, atomic, 23
Refractories, combustion chamber linings, 38
Refuelling in space, 1
Repulsor rocket, 122
Research Scene, 136, 193, 231
REVIEWS
  Analysis of Temperature, Pressure, and Density of the Atmosphere, Extending to Extreme Altitudes, 247
  Breathing in Irrespirable Atmospheres, 40
  Can We Fly to the Moon? 197
  Geology Applied to Selenology, Vol. III, 90
  Into the Atomic Age, 42
  Inventor and his World, 44
  L'Humanité devant la Navigation Interplanetaire, 42
  Observations of Mars and Its Canals, 41
  Outline of Stellar Astronomy, 90
REVIEWS—contd.
  Physik der Weltraumfahrt, 172
  Principles of High-Speed Flight, 39
  Principles and Methods of Telemetering, 130
  Rockets, Guns, and Targets, 250
  Science and Engineering of Nuclear Power, 129, 251
  Voyages to the Moon, 207
RFNA (*see* Nitric acid)
Rheinbote, 179
Rocket
  Aerobee, 2, 136, 137, 142, 232
  aircraft, 39, 87, 89, 143, 147, 245, 246
    performance, 37
  assisted take-off, 144, 145, 146, 229, 237, 246
  atomic, 23, 59, 149, 162, 198, 242, 253A
  Bell X–1, 39, 147
  Boeing GAPA, 146
  calculation, 129, 246
  Chinese, 127
  Convair 774, 128, 146
  developments, post-war, 143, 246
  expendable-tank step-, 163, 164, 171, 214
  future of, 86
  history, 39, 127, 172, 219, 245, 246
  interception of long-range-, 172
  ion-, 59
  Lark, 237
  man-carrying, 57, 215–6
  military, solid-fuel, 250
  Ministry of Supply, 237
  motors
    design of, 93, 129
    patent, 129
  motion of, theory, 245
  NATIV, 128, 146
  Natter, 222
  payload ratios, 179
  posts, 133, 219, 220, 254A
  propulsion, energy evolution, 21
  range, new U.S., 201
  Repulsor, 122
  societies, 20, 49, 114, 231, 256
  solid propellant, 39, 88, 246, 250
  Sprite, 229, 237, 246
  step-, 5, 55, 133, 141, 156, 171, 174, 198
  Tiling, 133, 140, 141
  tracking, 127, 196
  transonic, 148
  velocity, limiting, 38
  V.2, 2, 50, 89, 99, 100, 102, 107, 129, 136, 145, 179, 183, 193, 217
  V.2/WAC Corporal, 141
  Viking, 141, 145, 179, 234, 235, 236
  WAC Corporal, 179
Rocket Bases, 238
Rotochute, 128, 139

S

S.B.A.C. Air Show, 239
Saccule, in ear, 86

Safety, of oxidants, 97
Satellite, Artificial (*see also* Spacestation), 138
Saturn, escape velocity and gravity, 72
Schmidt telescope, 115
Selenology, geology applied to, 90
Servicing gantry, for rockets, 234
Shaped charge, 89
Shielding of Atomic Rockets, 149
Sic Itur ad Astra, 169
Skin temperature of V.2, 195
Sky, background illumination, 180, 255
Solar flares, 183, 224
Solar prominences, 223
Solar radiation, 182
  body temperature and, at high altitudes, 37
Solar system
  origin of, 120, 200
  potential energy diagram, 78
Solid atomic reactor, 23, 24
Soviet rocket developments, 238, 246
Spacecraft, 118
Spaceflight, 245, 246
  books, 39, 42, 172
  Dynamics of, 71
  energy problems, 129
"Spaceship I Departs," film, 50
Spacestation, 1, 8, 86, 138, 146
  air and food requirements, 14
  quarters and workrooms, 11
  relief procedure, 13
  research programme, 138
  staff, 11
  uses, 18, 138
Spacesuit, 40
Spacewards, 118
Specific impulse
  calculation, 102
  effective, 107
  of propellants, 94, 104
Spectrograph, in V.2, 182
Spectrohelioscope, 223
Spectroscopic binaries, 189
Spectrum, 182
Spirit of Astronautics in Germany in the Last 15 Years, 49
Spray region, of atmosphere, 255A
Sprite, de Havilland, 229, 237, 246
Stability
  of lunar surface, 132
  of rockets, 120
Stamps, rocket postage, 133, 134, 135, 219, 220, 221
Stars
  binary, spectroscopic detection, 189
  neutron, 116
Static tests, 111
Steels, nickel, 21
Stellar astronomy, 90, 189
Step principle, Earth-Moon-Earth trip, 5
Step rockets
  A.4/WAC Corporal, 141
  atomic/chemical, 156
Step rockets—contd.
  design, 175
  expendable-tank, 163, 164, 213
  lunar missile, 198
  mass ratios, 174
  model, 214
  parameters, 176
  postal, 133
Strobotelescope, 10
Structural factor, 177, 178
Sub-orbits, 5, 6
Südwestdeutsche GfW, 51, 114
Sun
  escape velocity, 72
  gravity, 72, 76
  prominences, 223
Supernovae, 115, 200
Supply systems, propellant, 107
Sweat cooling, 127
Swedish guided missile, 238
Swirl jet, 107

T

Tail drive or nose drive, 120
Tank materials, for oxidants, 98, 129
Tanker rockets, for refuelling, 6
Tanks
  expendable-, 165
  propellant, 108, 245
Telemetering, 124
  from A.4, 196
  principles, 130
Telescopes,
  lunar, 186
  photoelectric, 115
  Schmidt, 115
  spacestation, 10
Television
  and spacestation, 4, 8, 138
  survey of Moon, 132
Telluric lines, 183, 188
Temperature
  atmospheric, high-altitude, 247
  combustion, 94
  measurement of exhaust, 39
  problems in atomic reactors, 30
  recorder, spherical, 235
  skin-, V.2, 195
Testing, of rocket motors, 110, 129
Thermal balance, in spacestation, 18
Thermodynamic properties, of gases, 128, 129
Tiling rockets, 133, 140–1
Timekeeping, on Moon, 186
Titan, escape velocity and gravity, 72
Tracking, 127, 128, 196
Trajectory control, V.2, 194
Trajectories, 78
Trans-sonic rocket, 148

U

Universe, reconstruction of, 116, 192

Uranium^{233}
  critical mass, 25, 26
  melting point, 30
Uranium oxide, melting point, 30
Uranus
  escape velocity and gravity, 72
  new satellite, 200
U.S. Earth satellite vehicle programme, 138
U.S. rocket range, 201
Utricle, in ear, 86

V

V.2
  acceleration, 194
  cameras in, 136
  chamber pressure, 100
  characteristics, 179, 194
  cosmic ray measurements, 124, 128
  design altitude, 102
  developments in U.S.A., 89, 193
  experimentation, 194
  fruit fly experiments, 2
  fuels, 99
  ignition, 107
  photographs from, 129, 136, 145
  recovery of data, 195
  skin temperature, 195
  spectra taken from, 183
  telemetering, 195
  tracking, 195
V.2/WAC Corporal two-step rocket, 141
Velocity
  characteristic, 173
  escape, 72, 74, 83, 119
  for interplanetary trips, 80, 82
  of meteors, 159
Venus
  diameter, 120
  escape velocity and gravity, 72
  velocity to travel to, 80
Verein für Raumschiffahrt, 49
Vickers trans-sonic missile, 148
Viking rocket, 145, 234, 236
  characteristics, 179
  firing, 141, 235
  service gantry, 234

W

WAC Corporal, 179
WK9B fuel pump, 110
Wall friction, in nozzle, 102
Walter turbo-pump, 111
Water
  coolant, 99
  requirements, spacestation, 15
  shielding, 156
  working fluid, atomic rocket, 198
Weltraum, 50
"Weltraumschiff I Startet," film, 50
Westcott and the B.I.S., 205

X

X–1, 39
  photograph, 147

Z

Zeeman effect, 189
Zodiacal light, 180

AUTHOR INDEX

Carter, L. J. Rocket Posts, 133
Clarke, A. C.
  The Dynamics of Space-Flight, 71
  Meteors as a Danger to Space-Flight, 157
Cleaver, A. V. (*see also* Shepherd, L. R.).
  Nose Drive or Tail Drive? 120
  A Review of Progress in Astronautics Since the War, 143
  Mass Ratios, 173
Gatland, K. W.
  Rockets in Circular Orbits, 52
  The Research Scene, I-III, 136, 193, 231
Humphries, J. The Design of Rocket Motors, 93
Kaiser, H. K. The Spirit of Astronautics in Germany in the Last 15 Years. 49
Mather, S. M. The Planet Mercury, 119
Ovenden, M. W.
  Astronomy and Astronautics, 180
  Review of Astronomical Films, 223
Ross, H. E.,
  Orbital Bases, 1
  Sic Itur Ad Astra, 169
Shepherd, L. R.
  Note on Shielding of Atomic Rockets, 149
  A Critical Review of "Can We Fly to the Moon?" 197
———— and Cleaver, A. V. The Atomic Rocket, III-IV, 23, 59
Wholey, M. W. Conversazione: A Report of the Meeting, 213